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EXAMINER	
ANDERSON, DENISE R	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,350	ZUBACK, JOSEPH EDWARD	
	Examiner	Art Unit	
	Denise R. Anderson	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,10-15,17-23,25 and 28-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7,10-15,17-23,25 and 28-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 26, 2008 has been entered.

Claim Rejections - 35 USC § 112

3. Claims 21-23 were rejected as being indefinite under the second paragraph of 35 U.S.C. 112. The rejections to claims 21-23 remain for the reasons that follow.

4. Claims 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term “less than a predetermined quantity” in claim 21 is a relative term which renders the claim indefinite. The term "less than a predetermined quantity" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The suspended solids content

has been rendered indefinite by the use of the term “less than a predetermined quantity” in claim 21.

5. Claims 22 and 23 are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "sufficient to allow it to be returned to the ocean" in each of claims 22 and 23 is a relative term which renders both claims indefinite. The term "sufficient to allow it to be returned to the ocean" is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The suspended solids content has been rendered indefinite by the use of the term “sufficient to allow it to be returned to the ocean” in each of claims 22 and 23.

6. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 34, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103
Bray Is the Primary Reference

7. Method claims 1, 3-7, 10, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

8. Method claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

9. Apparatus claims 25 and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

10. Regarding independent claim 1 and dependent claims 3-7, 10, and 17-18, Bray discloses a “Method of Treatment of Liquids by Reverse Osmosis” where an “impure solution" is separated into “purified water . . . with concurrent production of a brine.” Bray, Title and Column 1, lines 37-38. Bray further teaches, “A spiral wound membrane module [25] is enclosed in a suitable casing to form a desalination unit illustrated in the drawing at 24.” Bray, Figure and Column 4, lines 19-21. Upstream and downstream of the desalination unit are "filters 18 and 18a being of conventional cartridge type with effective openings of 25 microns (0.001”) or less. Bray, Column 4, lines 27-28. Filter 18 is the recited primary microfiltration or ultrafiltration unit and filter 18a is the recited secondary microfiltration or ultrafiltration unit. Regarding backwashing, Bray discloses, "Periodically the direction of the flowing liquid through the system is reversed so that the impure feed liquid passes in opposite direction first through the second filter (as previously identified), then in the opposite direction through the membrane module, and then in opposite direction through the first filter. The back flushing action during each period of reversed flow back-washes and cleans the filter that has previously collected debris or particulate matter during the previous opposite direction flow period. Thus no

harmful particulate matter reaches the module to cause plugging . . . and the flow cycles effectively clean the filters with each flow reversal."

11. To recap, Bray discloses the method recited in claim 1. From the above paragraph, the Bray secondary filter (filter 18a) is a cartridge filter [claim 4] that is backwashed [claims 3 and 5]. The Bray method separates impure water [claim 6] into pure water and brine [claims 7 and 10]. The Bray filtering step has three stages of filtration [claim 17] in the form of two cartridge filters 18 and 18a and one membrane module 25, as shown in the Figure. Bray further teaches a coarse filter (mesh strainer 12) prior to the secondary filter (cartridge filter 18a) as recited in claim 18.

12. Bray discloses the claimed invention except that the secondary filter is a conventional cartridge filters and not the recited membrane filter of claim 1. Al-Samadi et al. teaches this in the context of “Microfiltration Enhanced Reverse Osmosis for Water Treatment.” Al-Samadi et al., Title. In Figure 1, Al-Samadi et al. discloses upgrading the residual reverse osmosis stream (line 18 out of the high pressure side 20 of RO membrane chamber 14) by pH adjustment or chemical oxidant "seed" adjustment. The stream enters a heat exchanger 26 and then is further filtered by an ultrafiltration or microfiltration cartridge filter (applicant’s secondary filter), before being recycled to the container 2. Al-Samadi et al. further discloses, “In FIG. 1, there is provided a container 2 into which waste water stream 4 is introduced. If stream 4 contains suspended solids, a prefiltration device such as an MF membrane, sand-bed filtration with or without flocculant addition, dead-end cartridge filtration or a combination of these may be used to remove the suspended solids that may foul the RO membrane.

In this process, an antiscalant 6 may be introduced to container 2, if desired." To recap, Al-Samadi et al. discloses a primary filter prior to a reverse osmosis unit. The residual reverse osmosis stream is chemically treated and filtered with a secondary filter, prior to recycling.

13. Bray discloses the claimed invention except that the secondary filter is a conventional cartridge filters and not the recited membrane filter. Al-Samadi et al. discloses this. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Bray conventional cartridge filter with a membrane filter, as taught by Al-Samadi et al., since Al-Samadi et al. states in the Abstract that such a modification would aid in provide "an improved method for extending the useful life of a reverse osmosis membrane."

14. In summary, Bray, in view of Al-Samadi et al., discloses or suggests all limitations recited in claims 1, 3-7, 10 and 18.

15. Method claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

16. Independent claim 20 recites the limitations of manufacturing the apparatus used in independent claim 1 and further recites a "controllable fluid pathway for directing the filtrate to backwash said primary microfiltration or ultrafiltration unit." Bray, in view of Al-Samadi et al., discloses claim 1 and Bray further teaches a four-way valve 16 in the Figure, with a timer that "will advantageously be arranged to reverse the flow through

filters 18 and 18a and desalination unit 24 periodically after substantially equal time intervals." Bray, Column 3, lines 42-44. Bray teaches this when it is stated, "In the drawing, the water input is shown at 10, the water first passing through a coarse screen strainer 12. Strained water is raised to elevated pressure by pump 14, the high pressure water line being connected to four-way valve 16 to which are also connected the inputs or outputs to filters 18 and 18a. Also connected to four-way valve 16 is back pressure regulator or flow control valve 20, from which brine flows to waste through connection 22. Filters 18 and 18a are connected also to the input or output ends, depending of course on the direction of flow therethrough, of desalination unit 24, which contains a spiral wound membrane module 25. Purified product water is produced from an end output connection 26 from unit 24. Timer 28 is arranged to activate four- way valve 16 so that for a predetermined period of time the water input from 10 will be through filter 18 into desalination unit 24, then out of this unit and through filter 18a, then through the four-way valve again and out through the connection to back pressure regulator valve 20. Periodically timer 28 will activate valve 16 to connect the water input from 10 to filter 18a through which it flows in the opposite direction from the previous flow, then through desalination unit 24 and filter 18 in the opposite direction, and then through valve 16 again and out to connection with regulator valve 20. The timer will advantageously be arranged to reverse the flow through filters 18 and 18a and desalination unit 24 periodically after substantially equal time intervals." Bray, Column 3, lines 18-44.

17. To recap, Bray, in view of Al-Samadi et al., discloses the claim 1 invention. Bray further teaches a controllable pathway, shown in the Figure, that uses a timer 28, to direct the filtrate from the secondary filter (filter 18a) to backwash the primary filter (filter 18). This occurs when the four-way valve 16 is in position to connect the water input to filter 18a and the brine outlet to filter 18. As such, Bray, in view of Al-Samadi et al., discloses or suggests all claim 20 limitations.

18. Claims 21-23 were already rejected above as being indefinite under the second paragraph of 35 U.S.C. 112. They are also rejected over Bray, in view of Al-Samadi et al., under 103(a). Bray states, "Brine released from the module 25 passing through either filter 18 or 18a (depending on the setting of four way valve 16 at the time) is regulated by flow control valve 20 to maintain 400 p.s.i.g. in the system, and is finally passed to sewer from connection 22." Bray, Column 4, lines 52-56. As such, the brine has a suspended solids content [claim 21] that allows it to be returned to an impure water source [claim 22], including the ocean [claim 23].

19. In summary, Bray, in view of Al-Samadi et al., discloses or suggests all limitations recited in independent claim 20 and dependent claims 21-23.

20. Claim 25 recites the apparatus manufactured by method claim 20, with no further limitations. As with claim 20, then, apparatus claim 25 is rejected under 35 U.S.C. 103(a) over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

21. Bray further discloses that the apparatus have ports [claims 28 and 29]. Note that the material being worked upon, as recited in claim 29, does not limit apparatus claims. As stated in MPEP 2115, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

22. In the Figure, Bray further teaches the conduit recited in claim 30. As shown in the claim 1 patentability analysis, the Bray secondary filter (filter 18a) is a backwashable cartridge filter [claim 31]. As shown in the claim 20 patentability analysis and in the Figure, the Bray reverse osmosis unit (desalination unit 24) is in fluid communication with the coarse filter (course screen strainer 12) [claim 34]. Note that claim 34 has also been rejected above under 35 U.S.C. 112, second paragraph, as being indefinite because of the phrase "such as."

23. In summary, Bray, in view of Al-Samadi et al., discloses or suggests all limitations recited in independent claim 25 and dependent claims 28-31 and 34.

24. Claims 17 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi et al., as applied to claims 1 and 25 above.

25. Dependent claims 17 and 32 recite multiple stages of filtration within the secondary filter. Bray, in view of Al-Samadi et al., discloses the claimed invention except that the secondary filter (Figure, filter 18a) is a single stage. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the Bray secondary filter multiple stages instead of a single stage, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

26. Dependent claim 33 further recites a coarse filter that Bray discloses in the Figure as course screen strainer 12.

27. In summary, Bray, in view of Al-Samadi et al., discloses or suggests all limitations recited in claims 17 and 32-33.

28. A second argument can be made. Dependent claims 17 and 32 recite multiple stages of filtration within the secondary filter. Bray discloses the claimed invention except that the secondary filter (Figure, filter 18a) is a single stage. In Figure 1, Al-Samadi et al. teaches a two stage secondary filter in the form of the ultrafiltration / microfiltration cartridge filter 24 and the solids separation unit 34. Al-Samadi et al. further teaches, "Solid separator 34 can comprise any means such as a filter press, a hydroclave, a cartridge or rollers that squeeze liquid from the solid particles through a filter cloth. The solids may conveniently be disposed of as filter cake, and liquid removed therefrom can be recirculated along line 36 to be reintroduced to container 2." It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Bray single stage secondary filter with a

multiple stage filter [claims 17 and 32], as taught by Al-Samadi et al., since Al-Samadi et al. states at Column 5, lines 6-10, that with such a modification, "[R]egardless of the feedstock, very high levels of liquid recovery can be obtained. That is, the system in accordance with the present invention can permit 70% to 80% and even 90% to 99% recovery of liquid or wastewater entering container 2."

29. In summary, Bray, in view of Al-Samadi et al., discloses or suggests all limitations recited in claims 17 and 32-33.

Claim Rejections - 35 USC § 103
Daly et al. Is the Primary Reference

30. Method claims 1, 3-7, 10, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (Daly et al. (Patent No. 6,120,688, Sept. 19, 2000), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

31. Method claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly et al. (Patent No. 6,120,688, Sept. 19, 2000), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

32. Apparatus claims 25 and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly et al. (Patent No. 6,120,688, Sept. 19, 2000), in view of Al-Samadi et al. (US Patent No. 5,501,798, Mar. 26, 1996).

33. The claims appear below in italics with the prior art and examiner's comments in normal font.

Claim 1. (Currently Amended) A method of purifying impure water (Daly et al., Abstract, line 1; Figure) *contaminated with a filterable impurity and a dissolved impurity, the method comprising the steps of:*

providing the impure water (Daly et al., Figure, water 8) *to a primary microfiltration or ultrafiltration unit* (Daly et al., Figure, microfilter 20) *to remove the filterable impurity and produce impure filtered water contaminated with the dissolved impurity* (Daly et al., Figure, water is introduced to the ultrafiltration unit through pipe 11 using pumping system 2 that has a feed pump and a raw water pump; Column 4, lines 11-14)*;*

providing the impure filtered water contaminated with the dissolved impurity to a reverse osmosis unit (Daly et al., Figure, reverse osmosis unit 70) *to produce a potable water stream* (Daly et al., Figure, line 76; Column 6, lines 38-40 and 51-53 where it is stated that the storage tank 80 stores potable water) *and a residual reverse osmosis stream* (Daly et al., Figure, line 82; Column 6, lines 28-38 where it is stated that impure filtered water is provided through lines 26, 35, 36, 37, 52, and 62 using process pumps 50 and 60)*;*

filtering the residual reverse osmosis stream by passing the stream through a secondary microfiltration or ultrafiltration membrane filter (Daly et al., Figure, microfilter 54; Column 7, lines 9-12, during backwash “pump 50 draws retentate from CIP tank 100 along line 104 through valve 44 (now open) along line 52 and into line 112, including quick-disconnect hose

113") *to produce filtered saline solution* (Daly et al., Column 3, lines 33-34 where it is taught that the "impure water source can include diverse water sources, including sea water"); *and*

backwashing the primary microfiltration or ultrafiltration unit (Daly et al., Figure, microfilter 20) *with the filtrate* (Daly et al., Figure, microfilter 54 is secondary filter providing filtrate; Column 7, lines 9-15, during backwash "pump 50 draws retentate from CIP tank 100 along line 104 through valve 44 (now open) along line 52 and into line 112, including quick-disconnect hose 113. On backflush, the retentate is directed through valve 42 (now open) through lines 36 and 26. The retentate enters the inside of tubular membrane 22 and dislodges foulants from the membranes.").

Daly et al. discloses the claimed invention except that it is not explicitly stated that the secondary filter is a membrane filter. Al-Samadi et al. teaches this in the context of "Microfiltration Enhanced Reverse Osmosis for Water Treatment." Al-Samadi et al., Title. In Figure 1, Al-Samadi et al. discloses upgrading the residual reverse osmosis stream (line 18 out of the high pressure side 20 of RO membrane chamber 14) by pH adjustment or chemical oxidant "seed" adjustment. The stream enters a heat exchanger 26 and then is further filtered by an ultrafiltration or microfiltration cartridge filter (applicant's secondary filter), before being recycled to the container 2. Al-Samadi et al. further discloses, "In FIG. 1, there is provided a container 2 into which waste water stream 4 is introduced. If stream 4 contains suspended solids, a prefiltration device such as

an MF membrane, sand-bed filtration with or without flocculant addition, dead-end cartridge filtration or a combination of these may be used to remove the suspended solids that may foul the RO membrane. In this process, an antiscalant 6 may be introduced to container 2, if desired." To recap, Al-Samadi et al. discloses a primary filter prior to a reverse osmosis unit. The residual reverse osmosis stream is chemically treated and filtered with a secondary filter, prior to recycling.

Daly et al. discloses the claimed invention except that the secondary filter is not explicitly the recited membrane filter. Al-Samadi et al. discloses this. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Daly et al. conventional cartridge filter with a membrane filter, as taught by Al-Samadi et al., since Al-Samadi et al. states in the Abstract that such a modification would aid in provide "an improved method for extending the useful life of a reverse osmosis membrane."

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all claim 1 limitations.

Claim 3. (Currently Amended) The method according to claim 1 wherein the secondary microfiltration or ultrafiltration membrane filter is backwashed.

Claim 4. (Currently Amended) The method according to claim 1 wherein the secondary microfiltration or ultrafiltration membrane filter is a cartridge filter.

Claim 5. (Currently Amended) The method according to claim 4 wherein the secondary microfiltration or ultrafiltration membrane filter is backwashed.

Daly et al., in view of Al-Samadi et al., discloses claim 1. Daly et al. further teaches that the primary microfiltration or ultrafiltration units are backwashed to clean them. Daly et al., Figure, Column 7, lines 13-15. Thus, Daly et al. implies backwashing the secondary filter that is a microfiltration filter and appears as reference number 54 in the Figure. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Daly et al. method, to backwash the secondary filter, as taught by Daly et al. for the primary microfiltration or ultrafiltration units, since such a modification would clean the secondary filter.

Daly et al., in view of Al-Samadi et al., discloses claim 1. Al-Samadi et al. further teaches that the secondary filter (filter 24) is an ultrafiltration / microfiltration cartridge filter in Figure 1. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the Daly et al. secondary filter a cartridge filter as taught by Al-Samadi et al., since Al-Samadi et al. states at Column 5, lines 50-53 that such a modification "provides a substantially precipitate or solid particle-free filtrate in low pressure side 30" of the secondary filter 24.

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all limitations recited in claims 3-5.

Claim 6. (Previously Presented) The method according to claim 1 wherein the impure water is sea water.

Claim 7. (Previously Presented) The method according to claim 1 wherein the filterable impurity includes those typically found in sea water.

Claim 10. (Previously Presented) The method according to claim 1 wherein the dissolved impurity includes sodium ions and chloride ions.

Daly et al., in view of Al-Samadi et al., discloses all claim 1 limitations. Daly et al. further teaches that the "impure water source can include diverse water sources, including sea water." Daly et al., Column 3, lines 33-34. Sea water contains sodium ions and chloride ions.

Claim 17. (Currently Amended) The method according to claim 1 wherein the step of filtering comprises filtering using multiple stages of filtration.

Daly et al., in view of Al-Samadi et al., discloses the claimed invention except that the Daly et al. secondary filter (Figure, microfilter 54) is a single stage. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the Daly et al. secondary filter multiple stages instead of a single stage, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

A second argument can be made. Claim 17 recites multiple stages of filtration within the secondary filter. Daly et al. discloses the claimed invention

except that the secondary filter (Figure, microfilter 54) is a single stage. In Figure 1, Al-Samadi et al. teaches a two stage secondary filter in the form of the ultrafiltration / microfiltration cartridge filter 24 and the solids separation unit 34. Al-Samadi et al. further teaches, "Solid separator 34 can comprise any means such as a filter press, a hydroclave, a cartridge or rollers that squeeze liquid from the solid particles through a filter cloth. The solids may conveniently be disposed of as filter cake, and liquid removed therefrom can be recirculated along line 36 to be reintroduced to container 2." It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Daly et al. single stage secondary filter with a multiple stage filter [claim 17), as taught by Al-Samadi et al., since Al-Samadi et al. states at Column 5, lines 6-10, that with such a modification, "[R]egardless of the feedstock, very high levels of liquid recovery can be obtained. That is, the system in accordance with the present invention can permit 70% to 80% and even 90% to 99% recovery of liquid or wastewater entering container 2."

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all claim 17 limitations.

Claim 18. (Currently Amended) The method according to claim 17 wherein the step of filtering comprises filtering through a coarse filter prior to filtering through the secondary microfiltration or ultrafiltration membrane filter.

Daly et al., in view of Al-Samadi et al., discloses all claim 17 limitations. Daly et al. further teaches a course filter (Figure, strainer 6) prior to filtering through a secondary filter (Figure, microfilter 54).

Claim 20. (Currently Amended) A method of facilitating the purification of impure water (Daly et al., Abstract, line 1; Figure)*, the method comprising the steps of;*

providing a primary microfiltration or ultrafiltration unit (Daly et al., Figure microfilter 20)*;*

providing a reverse osmosis unit (Daly et al., Figure, reverse osmosis unit 70) *in downstream fluid communication from said primary microfiltration or ultrafiltration unit* (Daly et al., Figure, microfilter 20; Column 6, lines 28-38 where it is stated that impure filtered water is provided through lines 26, 35, 36, 37, 52, and 62 using process pumps 50 and 60)*;*

providing a secondary microfiltration or ultrafiltration unit (Daly et al., Figure, microfilter 54; Column 7, lines 9-12, during backwash "pump 50 draws retentate from CIP tank 100 along line 104 through valve 44 (now open) along line 52 and into line 112, including quick-disconnect hose 113") *to produce a filtered saline solution* (Daly et al., Column 3, lines 33-34 where it is taught that the "impure water source can include diverse water sources, including sea water"); *and*

providing a controllable fluid pathway (Daly et al., Figure, Column 6, line 66 through Column 7, line 16) *for directing the filtrate to backwash said*

microfiltration or ultrafiltration unit (Daly et al., Figure, Column 6, lines 48-67 which states that the treated residual reverse osmosis stream 94 is stored in the CIP tank 100 for reuse as backwash for the tubular membranes 22 in the primary microfiltration or ultrafiltration unit 20; Column 7, lines 12-16 where it is stated, "Instead of drawing water from membranes 22, pump 50 draws retentate [applicant's filtered residual reverse osmosis feed] from CIP tank 100 along line 104, thorough valve 44 (now open) , along line 52 and into line 112, including quick-disconnect hose 113. On backflush, the retentate is directed through valve 42 (now open) through lines 36 and 26. The retentate enters the inside of tubular membranes 22 [part of applicant's microfiltration or ultrafiltration unit that Daly labels as reference number 20] and dislodges foulants from the membranes. Backflushing may be programmed at any desired interval for any desired period.")

As with claim 1, Daly et al. discloses the claimed invention except that it is not explicitly stated that the secondary filter is a membrane filter. Al-Samadi et al. discloses this. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Daly et al. conventional cartridge filter with a membrane filter, as taught by Al-Samadi et al., since Al-Samadi et al. states in the Abstract that such a modification would aid in provide "an improved method for extending the useful life of a reverse osmosis membrane."

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all claim 20 limitations.

Claim 21. (Previously Presented) The method according to claim 20 wherein the filtrate has a suspended solids content of less than a predetermined quantity.

Claim 22. (Previously Presented) The method according to claim 21 wherein the filtrate has a suspended solids content sufficient to allow it to be returned to the impure water source.

Claim 23. (Previously Presented) The method according to claim 22 wherein the filtrate used to backwash the filter has a suspended solids content sufficient to allow it to be returned to the ocean.

Claims 21-23 were already rejected above as being indefinite under the second paragraph of 35 U.S.C. 112. They are also rejected over Daly et al., in view of Al-Samadi et al., under 103(a).

Daly et al., in view of Al-Samadi et al., discloses all claim 20 limitations. Daly et al. further teaches that the "impure water source can include diverse water sources, including sea water." Daly et al., Column 3, lines 33-34. Daly et al. also teaches, "When CIP tank 100 is full, excess retentate is directed along line 102 to line or adapter 16 to line 18 back to the source of water 8." Daly et al., Figure and Column 6, lines 57-60. In other words, the filtrate from the Daly et al. secondary filter (Figure, microfilter 54) ends up as retentate in the CIP tank and

excess retentate from the CIP tank is directed back to the source of water that is seawater. As such, the filtrate from the secondary filter has a suspended solids content [claim 21] that allows it to be returned to an impure water source [claim 22], including the ocean [claim 23].

Claim 25. (Currently Amended) A system for purifying impure water (Daly et al., Abstract, line 1; Figure) *contaminated with a filterable impurity and a dissolved impurity, comprising:*

a primary microfiltration or ultrafiltration unit (Daly et al., Figure, microfilter 20) *to remove the filterable impurity;*

a reverse osmosis unit (Daly et al., Figure, reverse osmosis unit 70) *to produce a potable water stream* (Daly et al., Figure, line 76; Column 6, lines 38-40 and 51-53 where it is stated that the storage tank 80 stores potable water) *and a residual reverse osmosis stream* (Daly et al., Figure line 94),

said reverse osmosis unit (Daly et al., Figure, reverse osmosis unit 70) *in downstream fluid communication from said primary microfiltration or ultrafiltration unit* (Daly et al., Figure, microfilter 20; Column 6, lines 28-38 where it is stated that impure filtered water is provided through lines 26, 35, 36, 37, 52, and 62 using process pumps 50 and 60)*;*

a controllable fluid pathway (Daly et al., Figure, Column 6, line 66 through Column 7, line 16) *to transfer a stream of impure filtered water*

contaminated with a dissolved impurity from the primary microfiltration or ultrafiltration unit to the reverse osmosis unit (Daly et al., Figure, microfilter 20 and reverse osmosis unit 70; Column 6, lines 28-38 where it is stated that impure filtered water is provided through lines 26, 35, 36, 37, 52, and 62 using process pumps 50 and 60)*;*

a secondary microfiltration or ultrafiltration membrane filter (Daly et al., Figure, microfilter 54; Column 7, lines 9-12, during backwash "pump 50 draws retentate from CIP tank 100 along line 104 through valve 44 (now open) along line 52 and into line 112, including quick-disconnect hose 113") *to filter the residual reverse osmosis stream to produce a filtered saline solution* (Daly et al., Column 3, lines 33-34 where it is taught that the "impure water source can include diverse water sources, including sea water")*; and*

a controllable (Daly et al., Figure, Column 6, line 66 through Column 7, line 16) *fluid pathway directing the treated residual reverse osmosis stream to backwash the primary microfiltration or ultrafiltration unit.*

As with claims 1 and 20, Daly et al. discloses the claimed invention except that it is not explicitly stated that the secondary filter is a membrane filter. Al-Samadi et al. discloses this. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Daly et al. conventional cartridge filter with a membrane filter, as taught by Al-Samadi et al., since Al-Samadi et al. states in the Abstract that such a modification would

aid in provide “an improved method for extending the useful life of a reverse osmosis membrane.”

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all claim 25 limitations.

Claim 28. (Previously Presented) The system according to claim 25 further comprising one or any combination of ports for the introduction of chemical agents, irradiation means, ultrasonic generators, vortexing devices, heating elements, electroprecipitators and magnets.

Claim 29. (Previously Presented) The system according to claim 28 wherein the chemical agents are selected from the group consisting of chlorination agents, fluorination agents, ozonation agents, disinfecting agents, scale control treatment agents, water softening agents, peroxide, sulfite/bisulfite, and combinations thereof.

Claim 30. (Currently Amended) The system according to claim 25 for purifying impure water contaminated with a filterable impurity and a dissolved impurity further comprising: a conduit to transfer a residual reverse osmosis stream from the reverse osmosis unit to backwash the primary microfiltration or ultrafiltration unit via the secondary microfiltration or ultrafiltration unit.

Claim 31. (Currently Amended) The system according to claim 25 wherein the secondary microfiltration or ultrafiltration unit is a backwashable or disposable cartridge microfiltration or ultrafiltration system.

Claim 34. (Previously presented) The system according to claim 25 wherein the residual reverse osmosis stream is in controllable fluid communication with coarse backwashable filters such as single or multimedia filters, disc filters, diatomaceous earth filters, membrane filters, strainers, or screens.

Daly et al., in view of Al-Samadi et al., discloses or suggests all claim 25 limitations. Daly et al. further discloses that the apparatus have ports [claims 28 and 29]. Note that the material being worked upon, as recited in claim 29, does not limit apparatus claims. As stated in MPEP 2115, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d *>996<, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

In the Figure, Daly et al. further teaches the conduit recited in claim 30. As shown in the claims 4 and 5 patentability analyses, the Daly et al. filter is a backwashable cartridge filter [claim 31]. As shown in the claim 18 patentability analysis and in the Figure, the Daly et al. reverse osmosis unit (reverse osmosis unit 70) is in fluid communication with the coarse filter (strainer 6) [claim 34]. Note that claim 34 has also been rejected above under 35 U.S.C. 112, second paragraph, as being indefinite because of the phrase "such as."

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all limitations recited in dependent claims 28-31 and 34.

Claim 32. (Currently Amended) The system according to claim 25 wherein the secondary microfiltration or ultrafiltration unit comprises multiple stages of filtration.

Claim 33. (Currently Amended) The system according to claim 32 wherein the multiple stages of filtration include a first filtration through a coarse filter prior to filtration through the secondary microfiltration or ultrafiltration membrane filter.

Daly et al., in view of Al-Samadi et al., discloses the claimed invention except that the Daly et al. secondary filter (Figure, microfilter 54) is a single stage. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the Daly et al. secondary filter multiple stages [claim 32] instead of a single stage, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

A second argument can be made. Claim 32 recites multiple stages of filtration within the secondary filter. Daly et al. discloses the claimed invention except that the secondary filter (Figure, microfilter 54) is a single stage. In Figure 1, Al-Samadi et al. teaches a two stage secondary filter in the form of the ultrafiltration / microfiltration cartridge filter 24 and the solids separation unit 34. Al-Samadi et al. further teaches, "Solid separator 34 can comprise any means

such as a filter press, a hydroclave, a cartridge or rollers that squeeze liquid from the solid particles through a filter cloth. The solids may conveniently be disposed of as filter cake, and liquid removed therefrom can be recirculated along line 36 to be reintroduced to container 2." It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the Daly et al. single stage secondary filter with a multiple stage filter [claim 17), as taught by Al-Samadi et al., since Al-Samadi et al. states at Column 5, lines 6-10, that with such a modification, "[R]egardless of the feedstock, very high levels of liquid recovery can be obtained. That is, the system in accordance with the present invention can permit 70% to 80% and even 90% to 99% recovery of liquid or wastewater entering container 2."

As shown in the claim 18 patentability analysis and in the Figure, the Daly et al. reverse osmosis unit (reverse osmosis unit 70) is in fluid communication with the coarse filter (strainer 6) [claim 34]. Note that claim 34 has also been rejected above under 35 U.S.C. 112, second paragraph, as being indefinite because of the phrase "such as."

In summary, Daly et al., in view of Al-Samadi et al., discloses or suggests all limitations recited in dependent claims 33-34.

Claim Rejections - 35 USC § 103
Claims 11-15, 19, and 34 Reciting Water Treatments of Residual RO Stream

34. Claims 11-15, 19, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bray (US Patent No. 3,505,215, Apr. 7, 1970), in view of Al-Samadi

et al. (US Patent No. 5,501,798), as applied to claims 1 and 25 above, and further in view of the Water Encyclopedia (Jay Lehr, editor, John Wiley & Sons, Inc., New York, 2005) for the recited water treatments.

35. Claims 11-15, 19, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly et al. (Patent No. 6,120,688, Sept. 19, 2000), in view of Al-Samadi et al. (US Patent No. 5,501,798), as applied to claims 1 and 25 above, and further in view of the Water Encyclopedia (Jay Lehr, editor, John Wiley & Sons, Inc., New York, 2005) for the recited water treatments.

36. Applicant recites further treating a water stream, specifically the residual reverse osmosis stream, prior to reuse. In what follows, Daly et al. (or Bray), in view of Al-Samadi et al., discloses the claimed invention. In Figure 1, Al-Samadi et al. further teaches treating the residual reverse osmosis stream. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have treated the Daly et al. (or Bray) residual reverse osmosis stream, as taught by Al-Samadi et al., since Al-Samadi et al. states in the Abstract, lines 1-2 that such a modification "is an improved method for extending the useful life of a reverse osmosis membrane."

37. Water treatment is an old science, as evidenced by the five volumes in the Water Encyclopedia. The approach taken to the patentability analysis below is that Daly et al. (or Bray), in view of Al-Samadi et al. discloses the method of claim 1 and some of the various recited chemical treatments, radiation treatments, and physical treatments. The remaining treatments are taught in the Water Encyclopedia to further purify or enhance the residual reverse osmosis stream prior to reuse in the Daly et al. (or Bray) method. It

would have been obvious to one of ordinary skill in the art at the time the invention was made to apply needed treatments to the residual reverse osmosis stream in the Daly et al. (or Bray) method, as taught by the Water Encyclopedia, because such modifications would further purify or enhance the residual reverse osmosis stream prior to reuse.

Claim 11. (Previously Presented) The method according to claim 1 further comprising treating the residual reverse osmosis stream prior to backwashing by one or more of a chemical treatment, a radiation treatment or a physical treatment.

Daly et al. (or Bray), in view of Al-Samadi et al., discloses the claimed invention. In Figure 1, Al-Samadi et al. teaches a chemical treatment (chemical oxidant seed addition) and a physical treatment (filtering). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have chemically or physically treated the Daly et al. residual reverse osmosis stream, as taught by Al-Samadi et al., since Al-Samadi et al. states in the Abstract that such a modification would aid in provide "an improved method for extending the useful life of a reverse osmosis membrane."

A second argument can be made. Daly et al. (or Bray), in view of Al-Samadi et al., discloses the claimed invention. The Water Encyclopedia further teaches chlorination (a chemical treatment), ultraviolet or UV treatment (a radiation treatment) and ultrasonication (a physical treatment).

The Water Encyclopedia teaches a chemical treatment. One such chemical treatment is chlorination where "chlorine is added to water to kill disease-causing

bacteria, parasites, and other organisms." Water Encyclopedia, Chlorination, 2:88, Introduction, ¶ 1.

The Water Encyclopedia teaches a radiation treatment. One such radiation treatment is UV light that is used as "a reliable means of disinfection." Water Encyclopedia, Ultraviolet Disinfection, 1:466, What is UV Disinfection? ¶ 1.

Finally, the Water Encyclopedia teaches a physical treatment to purify water – namely ultrasonication or ultrasonic irradiation. In this treatment, water is irradiated with ultrasonic waves that heat up small water pockets to the point of vaporization. This is known as "cavitation" which "may function as a microreactor" to either destroy "volatile organic compounds inside" or serve as a "H*, OH*, OOH* radical source that may react with pollutants in the bulk of solution." Water Encyclopedia, Waste Treatment Techniques – Advanced, 1:875, Ultrasonic Irradiation, ¶ 1 and Figure 7.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to treat the residual reverse osmosis stream, if needed, by one or more chemical treatments, radiation treatments, or physical treatments, as taught by the Water Encyclopedia, because such a modification would either enhance or purify the water before reuse.

In summary, Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses or suggests all claim 11 limitations.

Claim 12. (Previously Presented) The method according to claim 11 wherein the

chemical treatment is selected from the group consisting of chlorination, fluorination, disinfection, scale control treatment, water softening, peroxide, sulfite/bisulfite, ozone and combinations thereof.

Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses all claim 11 limitations. The Water Encyclopedia further teaches:

Chlorination where "chlorine is added to water to kill disease-causing bacteria, parasites, and other organisms." Water Encyclopedia, Chlorination, 2:88, Introduction, ¶ 1.

Fluoridation where fluoride is added to community water supplies to prevent tooth decay. Water Encyclopedia, Fluoridation, 1:254, ¶ 1.

Scale control treatment where chemicals are added to solubilize calcium carbonate $CaCO_3$ and prevent it from scaling out on equipment – which causes equipment operating problems. Water Encyclopedia, Industrial Cooling Water – Scale Formation, 1:547-548, Scaling Control, ¶ 1.

Water softening where either hydrated lime [$Ca(OH)_2$] or quicklime (CaO) are added to the water to improve the quality for domestic use, i.e. reduce scale in water heaters or allow soap to lather well. Water Encyclopedia, Lime Softening, 1:322, ¶ 1.

Peroxide as an alternative disinfection method to chlorination. Water Encyclopedia, Threat Agent and Water Biosecurity, 1:88, Survival of Threat Agents in Water, last paragraph.

Sulfite / bisulfate for the dechlorination of water. Water Encyclopedia, Dechlorination, 1:169, ¶ 2.

Ozone as a "powerful oxidizing and disinfecting agent" and as one of the treatment "technologies for small drinking water systems." Water Encyclopedia, Treatment for Technologies for Small Drinking Water Systems, 1:458, paragraph entitled "Ozonation."

It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Daly et al. (or Bray) method, to treat the residual reverse osmosis stream, if needed, by one or more chemical treatments from the list of chlorination, fluorination, disinfection, scale control treatment, water softening, peroxide, sulfite/bisulfite, or ozone, as taught by the Water Encyclopedia, because such modifications would enhance the water before reuse.

In summary, Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses or suggests all claim 12 limitations.

Claim 13. (Previously Presented) The method according to claim 11 wherein the radiation treatment is selected from the group consisting of UV, IR, microwave and combinations thereof.

Daly et al., in view of the Water Encyclopedia, discloses all claim 11 limitations. The Water Encyclopedia further teaches:

UV irradiation as "a reliable means of disinfection." Water Encyclopedia, Ultraviolet Disinfection, 1:466, What is UV Disinfection? ¶ 1.

Heat can be used to purify water via vaporization. Water Encyclopedia, Wastewater Treatment and Recycling Technologies, 1:813, Thermal Technologies - Distillation, ¶ 1. Both IR and microwave irradiation can serve as heat sources.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Daly et al. (or Bray) method, to treat the residual reverse osmosis stream, if needed, by one or more radiation treatments from the list of UV, IR and microwave, as taught by the Water Encyclopedia, because such modifications would enhance the water or purify it before reuse.

In summary, Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses or suggests all claim 13 limitations.

Claim 14. (Previously Presented) The method according to claim 11 wherein the physical treatment is selected from the group consisting of ultrasonication, vortexing, and combinations thereof.

Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses all claim 11 limitations. The Water Encyclopedia further teaches:

Ultrasonication where water is irradiated with ultrasonic waves that heat up small water pockets to the point of vaporization. This is known as

"cavitation" which "may function as a microreactor" to either destroy "volatile organic compounds inside" or serve as a "H*, OH*, OOH* radical source that may react with pollutants in the bulk of solution." Water Encyclopedia, Wastewater Treatment Techniques – Advanced, 1:875, Ultrasonic Irradiation, ¶ 1 and Figure 7.

Vortexing where solids are separated from sewage water. Water Encyclopedia, Combined Sewer Overflow Treatment, 1:784, Physical Treatment – Swirl/Vortex Technologies, ¶ 1, Figure 3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Daly et al. (or Bray) method, to treat the residual reverse osmosis stream, if needed, by one or more physical treatments from the list of ultrasonication or vortexing, as taught by the Water Encyclopedia, because such modifications would enhance or purify the water before reuse.

In summary, Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses or suggests all claim 14 limitations.

Claim 15. (Currently Amended) The method according to claim 11 wherein the treatment is selected from the group consisting of heat, electroprecipitation, magnetic treatments and combinations thereof.

Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses all claim 11 limitations. The Water Encyclopedia further teaches that:

Heat can be used to purify water via distillation. Water Encyclopedia, Wastewater Treatment and Recycling Technologies, 1:813, Thermal Technologies – Distillation, ¶ 1.

Electroprecipitation (electrolysis) can be used to deposit or decompose soluble inorganics or organics on to an electrode surface by an electrochemical redox reaction. Water Encyclopedia, Wastewater Treatment and Recycling Technologies, 1:812, Electrical Technologies – Electrolysis, ¶ 1.

Magnetic treatments can be used to control hard water scale. Water Encyclopedia, Physical Water Conditioning, 1:141, ¶ 1.

It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Daly et al. (or Bray) method to treat the residual reverse osmosis stream, if needed, by one or more treatments from the list of heat, electroprecipitation, or magnetic treatments, as taught by the Water Encyclopedia, because such modifications would enhance or purify the water before reuse.

In summary, Daly et al., in view of the Water Encyclopedia, discloses or suggests all claim 15 limitations.

Claim 19. (Previously Presented) The method according to claim 18 wherein the residual reverse osmosis stream is in controllable fluid communication with a coarse backwashable filter selected from the group consisting of a single or

multimedia filter, a disc filter, a diatomaceous earth filter, a membrane filter, a strainer, a screen and combinations thereof.

Claim 34. (Previously presented) The system according to claim 25 wherein the residual reverse osmosis stream is in controllable fluid communication with coarse backwashable filters such as single or multimedia filters, disc filters, diatomaceous earth filters, membrane filters, strainers, or screens.

Daly et al. (or Bray), in view of Al-Samadi et al., discloses all claim 18 (or claim 25) limitations including that the residual reverse osmosis stream is in controllable fluid communication with backwashable filters. Daly et al., Figure, Column 6, line 66 through Column 7, line 16; Bray, Figure, screen strainer 12 in fluid communication with desalination unit 24. Daly et al. (or Bray) further discloses strainers. Daly et al., Figure, reference number 6; Column 3, lines 53-55; Bray, Figure, screen strainer 12. The Water Encyclopedia also discloses backwashable filters and further teaches single or multimedia filters, disk filters, diatomaceous earth filters, membrane filters, and screens.

Backwashable filters are used so that they can be cleaned and, thus, filtrate quality is maintained. Water Encyclopedia, Filtration Water Treatment, 1:245-246, first two paragraphs of the article.

Single or multimedia filters are used to produce clear water and to improve taste and reduce odor: Water Encyclopedia, Filtration Water Treatment, 1:245-246, first paragraph of the article and sixth paragraph of the article.

Disk filters such as are used to aerate water. These filters are often sintered ceramic plates: Water Encyclopedia, Fine Bubble Diffused Air Aeration Systems, 1:626, Figure 4 and the third paragraph of the article.

Diatomaceous earth filters are used to remove particles in the water: Water Encyclopedia, Filtration Water Treatment, 1:247, third paragraph on the page beginning with "Diatomaceous earth filtration."

Membrane filters are used to produce potable water from seawater or brackish water: Water Encyclopedia, Filtration Water Treatment, 1:247, fourth paragraph on the page beginning with "Membrane filtration."

Strainers: Daly et al., Figure, strainer 6; Bray, Figure, screen strainer 12.

Screens are used to remove solids from wastewater. Water Encyclopedia, Wastewater Treatment and Recycling Technologies, 1:809, paragraph following the title "Screening, Filtration, and Centrifugal Separation."

It would have been obvious to one having ordinary skill in the art at the time the invention was made to match the Daly et al. (or Bray) method with the correct filter alternative listed in the claim and taught by the Water Encyclopedia, because such a modification would achieve the design objectives for the particular situation at hand.

In summary then, Daly et al. (or Bray), in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses or suggests all claim 19 limitations and all claim 34 limitations. Note that claim 34 has also been rejected above

under 35 U.S.C. 112, second paragraph, as being indefinite because of the phrase “such as.”

In summary, Daly et al., in view of Al-Samadi et al., in further view of the Water Encyclopedia, discloses or suggests all limitations recited in dependent claims 19 and 34.

Response to Arguments

38. Regarding the 112 indefiniteness rejections, applicant's arguments filed June 26, 2008 have been fully considered but they are not persuasive.

39. Applicant argues that claims 21-23 are definite because “one skilled in the art would be able to readily define a 'sufficient’ suspended solids content . . . that provides discharge level that may not be exceeded by regulations." Applicant's Remarks, page 7, lines 17-20. The examiner's response is that there is nothing in the specification to define ‘sufficient’ for one of ordinary skill in the art. Furthermore, incorporating a solids content limitation by referring to a government regulation also renders the claim indefinite because government regulations change.

40. Applicant argues that claims 21-23 are definite because, “A ‘predetermined quantity’ . . . can be typically determined or chosen by a user of the method or the controller system." Applicant's Remarks, page 7, lines 11-14. The examiner's response is that there is nothing in the specification to define a 'predetermined' solids content for one of ordinary skill in the art.

41. Regarding the 102 and 103 rejections, applicant has amended the claims. Applicant's arguments with respect to independent claims 1, 20, and 25 and dependent claims 3-5, 11-15, 17-19, 25, and 28-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

42. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

43. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

44. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

/Krishnan S Menon/
Primary Examiner, Art Unit 1797